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(54) **ABSORBENT PANTS-TYPE DIAPER**

**ABSORBIERENDE, HOSENÄHNLICHE WINDEL**

**COUCHE-CULOTTE ABSORBANTE**

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## Description

[0001] The present invention relates to an absorbent pants-type diaper of the kind which is intended for one-time use only and which comprises a front-part, a back-part, a crotch-part that extends between said front and back parts, at least two side-closure parts which mutually join parts of the side-edges of the front and back parts such that the diaper will include a waist opening and two leg openings, said diaper further comprising an elongated absorbent pad having a front and a rear end-part and a centre-part located therebetween, an inner casing layer placed on that side of the pad which is intended to face towards the wearer in use and an outer casing layer, or backing sheet, placed on the other side of the absorbent pad.

[0002] In the case of diaper-wearing children who are in a transition period in which they learn to control the discharge of urine and are weaned-off the use of conventional diapers and trained to perform their bodily evacuative functions on the toilet, there is a need for an absorbent article which while absorbing body fluids will, at the same time, resemble a pair of conventional underpants. Absorbent pants-type diapers which are intended to be worn during such weaning or training periods are often referred to as training pants. One significant difference between an absorbent pants-type diaper and a conventional diaper is the manner in which they are intended to be worn in daily use. Absorbent pants-type diapers shall be capable of being taken-off and put-on repeatedly in the same manner as a pair of conventional underpants, until the wearer urinates in the pants-type diaper, whereupon the urine is absorbed by the pants, in precisely the same manner as a diaper, so that the pants-type diaper will continue to function as underpants in a user-safe fashion, until there is time and the opportunity to replace the soiled pants-type diaper with a fresh diaper. The soiled diaper can then be thrown away. The pants-type diaper will preferably be designed to give the wearer a decisive feeling that he/she is wearing a garment which is different to the diapers earlier used, and so that the wearer is able to remove the diaper easily, for instance when going to the toilet. In this latter respect, it is important, among other things, to give the pants-type diaper the form of a pair of pants, i.e. an article which has a waist opening and two leg openings, and not the form of a diaper that has fastener tabs or the like for joining the back-part of the diaper to the front-part thereof when putting-on the diaper. This latter procedure is highly complicated and extremely difficult for a child, or even an adult person, to achieve by himself/herself. In the case of known disposable pants-type diapers, or training pants, it has also been proposed to include an outer casing layer which is made of a textile-like, disposable material, such as to assimilate a genuine textile material to the greatest possible extent, so that primarily adult wearers are relieved of the psychologically negative association with napkins

that is given unavoidably by the plastic outer casing sheets or layers characteristic of disposable diapers.

[0003] However, the requirement for pants-type diapers to resemble a pair of underpants creates a number of problems. The fastener tabs which function to secure diapers around the wearer's body also fulfil the important role of supporting the extra load occasioned by the not inconsiderable amount of fluid that is delivered to the absorbent pad. As a result of the fastener tabs, the waist part of the diaper, i.e. that part around the wearer's waist which is formed when the fastener tabs are secured to the diaper, becomes rigid and unyielding to a certain extent in those parts where the fastener tabs are attached. The waist parts of the diaper are thus prevented from stretching to an extent beyond that permitted by the material in the waist part of the diaper and in the rigid or inflexible fastener tabs. Naturally, the extent to which the waist part will yield or give varies among known fastener tabs, although the fastener tabs will normally place a limit on the extent to which the waist parts of the diapers can stretch. Consequently, the diapers remain safely in position on the wearer, even when the absorbent pad has been filled with urine, at least provided that the fastener tabs are secured tightly enough. This waist-tightening mechanism is not found in pants-type diapers, since they lack the provision of fastener tabs. Thus, the pants-type diapers are held-up around the wearer's waist totally through the agency of the diaper casing layers or sheets and any elastication that may be provided. When considering that pants-type diapers are intended to be used by diaper-wearing children from about two to four years of age, or by older children who suffer from incontinence, or even by adults, it will be understood that the quantities of fluid that are liable to be absorbed by the absorbent pad can be quite considerable and therewith also the weight that acts on the diapers. Consequently, high demands are placed on the construction of such pants-type diapers with regard to their load-supporting capacity, so that the pants-type diapers will not fall down the legs of the wearer under the weight of the fluid absorbed.

[0004] In addition to being able to support the weight of the absorbed fluid, the pants-type diaper shall also fit snugly around the wearer's body. Furthermore, the diaper shall be sufficiently elastic or stretchable to enable it to be readily pulled on and off.

[0005] The U.S. Patent Specification 4,205,679 teaches an absorbent pants-type diaper which is constructed from one or more layers of stretchable non-woven fabric. According to one preferred embodiment, both the outer and the inner casing sheet of the pants-type diaper is made of a micro-corrugated or micro-pleated non-woven material which in the manufacture of the material can be made stretchable in two directions, i.e. in the machine direction and in a direction transversely thereto. Elastic elements, for instance in the form of an elastic natural-rubber bands or ribbons are also mounted along the end-edges of the diaper, i.e. at

its waist opening.

[0006] European Patent Application EP 0 320 991 A2 teaches an absorbent pants-type diaper which includes a central absorbent unit and two side-pieces which are joined with the absorbent unit along parts of the side-edges thereof. The side-pieces include elastic side-parts. In addition, elastic elements may be mounted to provide waist and leg elastic in certain embodiments. On the other hand, none of the casing sheets of the absorbent unit is made of an essentially stretchable material. The object of the invention is to provide vertical force vectors which function to urge the absorbent unit against the crotch of the wearer, and inwardly directed, horizontal force vectors towards the wearer's hips such as to press the absorbent unit against the sides of the wearer.

[0007] The European Patent Application EP 0 412 549 A1 teaches an absorbent pants-type diaper which includes elastic inner and outer casing sheets or layers and an elastic barrier layer mounted between said casing sheets. The pants-type diaper also includes elastic elements at both the waist and the leg openings.

[0008] The U.S. Patent Specification 4,690,681 teaches a pants-type absorbent article that is intended for use with menstruation or mild incontinence. The absorbent pad is integrated with the article and the front and the back part of the article extend further up the body of the wearer than in the case of "normal" menstruation pads. On the other hand, the size of the absorbent pad is so restricted as to be considered unsuitable for use in absorbing larger quantities of urine. The absorbent pants include waist and leg elastic. The pants also include casing layers which are made of a stretchable material, for instance a mixture of nylon and cotton. The absorbent pad is located in an impermeable zone of the pants, between the side-pieces thereof. This impermeable zone includes non-stretchable material and the stretchability required to enable the pants to shape to the wearer's body is obtained totally from the stretchable material in the casing layers.

[0009] None of the aforementioned absorbent trouser diapers solves the problem of ensuring that the pants-type diapers will be capable of maintaining the absorbent pad in conforming abutment with the wearer's body and also of supporting the absorbent pad subsequent to the pad being filled with a large quantity of liquid.

[0010] Pants-type diapers which comprise casing layers that are made of stretchable material, such as the pants-type diapers taught by U.S. 4,205,679 and EP 0 412 549, are unsatisfactory because the casing layer in the crotch-part of the diaper in which the absorbent pad is located is also stretchable. Thus, the casing layer in the crotch-part of the diaper will stretch under the weight of the absorbent pad and the diaper will sag or hang like a sack between the legs of the wearer, that is if the diaper can be held-up at all. This is particularly disadvantageous when the casing layer is able to stretch in

the longitudinal direction of the pants-type diapers, i.e. in a director away from the waist part to the crotch-part of the diaper, since the force of gravity acts in this direction when the wearer stands upright, therewith increasing the strain on the casing layer in this direction.

[0011] Pants-type diapers which have solely elastically stretchable side-pieces or elastically stretchable casing layers in diaper parts other than those parts in which the absorbent pad is arranged, as taught by EP 0 320 991 and U.S. 4,690,681 respectively, also suffer drawbacks. The elastically stretchable parts of the casing layers of these diapers are not sufficiently effective to be able to hold the absorbent pad in against the wearer's body, above all the front-part of the absorbent pad against the wearer's stomach. Neither are the elastically stretchable side-pieces alone sufficiently active to be able to support the increase in load that results from the absorption of fluid by the absorbent pad. Neither are elastic elements that are mounted along the waist opening of the trouser diapers outside the end-edges of the absorbent pad satisfactory in holding the absorbent pad against the wearer's stomach or in supporting a liquid-filled absorbent pad.

[0012] The present invention, however, provides an absorbent pants-type diaper of the kind defined in the introduction which will effectively enable the diapers to lie sealingly against and shape conformingly to the wearer's body, while enabling the diapers to support an absorbent pad even when the pad is full of liquid. An inventive pants-type diaper is primarily characterized in that essentially the whole of at least one of the front and the back parts of the diaper is covered by an elastically stretchable region; in that the crotch-part is essentially non-stretchable in relation to said stretchable region; in that at least one of the respective end-parts of the absorbent pad is disposed within one of said elastically stretchable regions while the centre-part of the absorbent pad is disposed within the relatively non-stretchable crotch-part of the diaper, whereby those forces exerted by the elastically stretchable region on the end-part or end-parts of the absorbent pad will hold the absorbent pad in sealing abutment with the wearer's body when the trouser diaper is worn.

[0013] According to one embodiment of the invention, the stretchable region extends beyond the side-edges and end-edge of the front and/or the back end-part of the absorbent pad.

[0014] According to a further embodiment of the invention, the stretchable region can stretch essentially in the transverse direction of the absorbent pad, but is essentially non-stretchable in the longitudinal direction of said pad.

[0015] The elastically stretchable region may, for instance, include elastically stretchable elements, e.g. elastically stretchable threads, bands, ribbons or the like which are mounted in a pre-stretched state, or an elastically stretchable material layer, for instance an elastically stretchable film, an elastically stretchable non-

woven material, laminate, foamed material or the like.

[0016] According to another embodiment, the pants-type diaper includes elastically stretchable waist parts at the end-edge of the front and/or the back part at the waist opening of the diaper, said waist parts exhibiting a greater stretching and contraction force than the stretchable region in the front and/or the back part.

[0017] In the case of another embodiment of the invention, the elastically stretchable part at the waist opening includes an edge-part of the elastically stretchable material layer, said edge-part having at least twice the thickness of the remaining parts of said elastically stretchable material layer, as a result of folding the elastically stretchable material layer inwardly over itself at least once within said edge-part.

[0018] According to the present invention, the elastically stretchable region forms an elastically stretchable waist zone over the whole of or over parts of the front and/or the back parts of the diaper, said parts also extending over at least one end-part of the absorbent pad.

[0019] The elastic waist zone has an essentially greater extension over the diaper in a direction from its end-edge than conventional, relatively narrow elastic elements mounted along the end-edge of the pants-type diaper. Furthermore, the elastic waist zone extends over the end-part or end-parts of the absorbent pad and not solely in the side-pieces externally of the side-edges of the absorbent pad, as in the case of the pants-type diaper taught by EP 0 320 991. In this way, there is obtained an elastically stretchable region in a waist zone which provides much better holding of the absorbent pad than that afforded by the earlier known solutions with elastic elements or side-pieces mounted outside the end-edges and side-edges of the absorbent pad.

[0020] The elastic waist zone of the inventive pants-type diaper is also highly significant in enabling the pants to remain in position on the wearer as the load increases. It is also important that the crotch-part of the diaper pants is essentially non-stretchable in comparison with the elastically stretchable waist zone. Thus, the casing layers within the crotch-part will not stretch under the weight of the liquid-filled absorbent pad, as is the case with the earlier known pants-type diapers that are comprised of totally stretchable casings.

[0021] According to one particularly advantageous embodiment of the invention, the elastic waist zone can stretch in the transverse direction of the absorbent pad, but is relatively non-stretchable in the longitudinal direction of said pad. This is advantageous, because it counteracts the tendency of the casing layer of the pants-type diaper to stretch in the longitudinal direction of the absorbent pad, such stretching otherwise resulting in greater risk that the diaper will sag or hang down between the legs of the wearer.

[0022] A particular advantage is obtained with an elastic waist zone which extends essentially over the full width of the front and the back parts, i.e. around the

whole of the waist part formed by the diaper pants. This will increase the girth of the pants in comparison with pants provided solely with elastically stretchable side-pieces, which is important among other things in order to enable the waist opening to be widened when taking-off and putting-on the pants and to enable pants of one and the same size to fit users of different sizes, therewith restricting the number of pants-type diaper sizes to a minimum.

[0023] The invention will now be described in more detail with reference to exemplifying embodiments thereof and also with reference to the accompanying drawings, in which

Figure 1 illustrates schematically and from above an absorbent pants-type diaper constructed in accordance with the invention, with that side of the diaper that is intended to lie distal from the wearer facing towards the viewer, said diaper being shown in a state in which the front and the back parts thereof have still not yet been joined together to form waist and leg openings respectively, and in which the elastic elements of the diaper are in a stretched state;

Figure 2 is a sectional view taken on the line II-II in Figure 1;

Figure 3 is a front view which illustrates the pants-type diaper in an assembled state; and

Figure 4 is a perspective view of a simplified embodiment of a waist part of pants-type diapers in accordance with another embodiment of the invention.

[0024] Figure 1 illustrates an absorbent pants-type diaper in an unassembled state, i.e. a state in which the waist and leg openings of the pants have not yet been formed. The pants-type diaper includes a front-part 1, which is intended to be placed forwardly on the wearer, a back-part 2, which is intended to be placed rearwardly on the wearer, and a crotch-part 3 which is located between the front and the back parts 1, 2 and which is intended to be placed between the thighs of the wearer. No precise limits can be drawn between the respective parts and the size relationships therebetween can vary, and consequently the division illustrated in Figure 1 can only be seen as a schematic example. Each of the front and the back parts have two side-edges 4, 5 and one end-edge 6, 7. The crotch-part 3 has two side-edges 8. As will be seen from Figure 3, when the pants-type diaper is in its assembled or ready-to-wear state, the diaper has a waist opening 9 between respective end-edges 6, 7 of the front and the back parts, and two leg openings 10, 11 which are surrounded by respective side-edges 8 of the crotch-part. Respective side-edges 4 of the front-part are joined to corresponding respective side-edges 5 of the back-part, such that the pants-type diaper will present two side-closure parts 12, 13 which extend from the waist opening 9 to respective leg openings 10, 11 on

respective sides of the diaper. The side closures may be obtained with the aid of heat-sealing, ultrasonic-welding, gluing or sewing techniques or some other suitable conventional technique.

[0025] It will be seen from Figures 1 and 2 that the pants-type diaper includes an elongated absorbent pad 14 which extends in the longitudinal direction of the diaper and which is enclosed between an inner casing layer 15 and an outer casing layer 16, with the latter layer facing towards viewer of Figure 1. The inner casing layer 15 is placed on that side of the absorbent pad 14 which faces towards the wearer in use and is liquid-permeable and comprised, for instance, of a non-woven material. The fibres may be comprised, for instance, of polyethylene, polypropylene, polyester or mixtures thereof. They may also be comprised of viscose fibres. It is also conceivable for the inner casing layer 15 to be comprised of a perforated plastic sheet, for instance perforated polyethylene film or the like. The outer casing layer or backing sheet 16 is liquid-impermeable or at least hydrophobic and may, for instance, be comprised of a sheet of polyethylene or a non-woven material which has been coated or laminated with polyolefins for instance, so as to become liquid-impermeable or at least hydrophobic.

[0026] The absorbent material in the absorbent pad 14 may, for instance, comprise cellulose fibres. The material may also include other absorbents, such as polymeric hydrocolloidal material, for instance in particle form. Such materials are normally referred to as superabsorbents, by which is meant materials whose liquid absorbing capacity is equal to many times their own weight. The absorbent pad may also include non-absorbent material, for instance thermoplastic melt fibres, with the intention of strengthening the absorbent pad. Although the absorbent pad 14 shown in Figure 2 has only one single layer, it will be understood that the absorbent pad may conceivably comprise more than one layer.

[0027] The illustrated absorbent pad 14 also has a front end-part 17, a rear end-part 18, an intermediate centre-part 19, two side-edges 20, 21 and two end-edges 22, 23. The absorbent pad 14 is essentially rectangular in shape, although the two end-parts 17, 18 are slightly wider than the centre-part 19. The absorbent pad, however, is not restricted to the shape illustrated in Figure 1, and other shapes, such as hourglass shapes or T-shapes are conceivable.

[0028] The extension of the inner casing layer 15 is equally as large as the extension of the pants-type diaper. The absorbent pad 14 is narrower and shorter than the inner casing layer 15 and is displaced slightly forwards in the diaper, wherein the front end-part 17 of the absorbent pad is located in the front-part 1 of the diaper, the centre-part 19 of the absorbent pad is located in the crotch-part 3 of the diaper and the rear end-part 18 of the absorbent pad has parts located in both the crotch-part 3 of the diaper and in the back-part 2. The front

end-edge 22 of the absorbent pad is disposed closer to the front end-edge 6 of the diaper than the rear end-edge 7 is disposed relative to the rear end-edge 23 of the absorbent pad. Naturally, other variants are conceivable. For instance, the absorbent pad may extend essentially along the whole length of the diaper, or alternatively no part of the absorbent pad may be disposed in the back-part at all, when, in the former case, it is desired to increase the size of the absorbent pad or, in the latter case, when wishing to produce a more airy diaper. The other casing layer 16 does not have the same longitudinal extension as the inner casing layer 15, and the rear end-edge of the outer layer, indicated by the broken line 24, terminates just short of the rear end-edge 23 of the absorbent pad. Furthermore, the outer casing layer 16 in the rear-part 2 of the diaper only extends laterally through a small distance outside the side-edges 20, 21 of the absorbent pad. Neither does the outer casing layer 16 in the front-part 1 of the diaper pants extend laterally and longitudinally to the same extent as the inner casing layer 15, but solely extends through a short distance beyond the front end-edge 22 and the side-edges 20, 21 of the absorbent pad, as indicated by the broken line 25 in Figure 1. This means that large parts of the back-part 2 and the front-part 1 of the diaper pants will not be covered by the outer casing layer 16, thereby facilitating the passage of air through the diaper casing within these parts. Naturally, the outer casing layer 16 may also have an extension which coincides essentially with the extension of the inner casing layer 15, when wishing to improve protection against leakage over essentially the whole of the surface of the casing layers, in which case the outer casing layer 16 is preferably made permeable to both air and vapour.

[0029] A plurality of transverse elastic elements 26, for instance elastic threads, bands, ribbons or the like, are mounted in a pre-stretched state transversely over the front-part 1 and the rear-part 2. The number of elastic elements provided is not restricted to the number shown in Figure 1, and the number of elements 26 may be more or less than that shown. In the front and the back parts 1 and 2, respective layers 27 and 28 of textile-like material, for instance non-woven material, are placed outermost on the diaper. The elastic threads 26 are mounted between these layers 27, 28 and the outer casing layer 16 and the inner casing layer 15 within those parts of the front and back parts in which the outer casing layer 16 does not extend. The back layer 28 and also the front layer 27 thus extend slightly in over the rear end-edge 23 and the front end-edge 22 of the absorbent pad, said layers also covering a piece of the outer casing layer 16. Instead of two separate textile-like layers, it is conceivable to apply one single textile-like layer over the whole of the diaper, this layer similarly covering the elastic elements 26 and also the whole of the outer casing layer 16.

[0030] Thus, the front and the back parts 1, 2 of the diaper pants will have regions 29, 30 which are elasti-

cally stretchable essentially in the transverse direction of the diaper and which, in the Figure 1 embodiment, coincide essentially with the front and the back parts 1, 2. Instead of elastic bands, ribbons, threads or the like, it is conceivable for the stretchable regions 29, 30 to comprise an elastically stretchable material, for instance an elastically stretchable film, an elastically stretchable non-woven material, laminate, foamed material or the like. An elastically stretchable film may, for instance, include ethylene vinyl acetate, ethylene acrylic acid, ethylene butyl acetate, polyurethane, styrene butadiene, polybutadiene, polyisoprene, isoprene rubber or ethylene propylene rubber. A similar elastically stretchable material may also be disposed so that the elastically stretchable regions 29, 30 are essentially stretchable solely in the transverse direction of the diaper.

**[0031]** The aforesaid elements 26 or said materials are joined with at least a respective one of the inner or outer casing layers 15, 16 or respective textile-like layers 27, 28 in respective elastically stretchable regions 29, 30, at least in discrete regions.

**[0032]** The pants-type diaper also has elastically stretchable front and back waist parts 31, 32 along the front and the rear end-edge 6, 7 of the diaper respectively. Two elastic elements 33 are mounted along respective end-edges 6, 7 within respective waist parts 31, 32. These elastic elements 33 may also be fewer or more than two in number. The elastic elements 33 may be comprised of elastic threads, bands, ribbons or the like mounted in a pre-stretched state. The elastic elements 33 in the waist parts 31, 32 may also exhibit greater stretching and contraction power than the individual elastic elements 26 in the aforesaid elastically stretchable regions 29, 30. For instance, the elastic elements 33 in the waist parts 31, 32 may be comprised of broad and strong bands, whereas the elastic elements 26 in the elastically stretchable regions 29, 30 may be comprised of thin threads.

**[0033]** As an alternative to threads or bands, it is conceivable to use elastic films, laminates, non-woven material, foamed material or like material also in the waist parts 31, 32. For instance, in this regard, it is possible to use the same elastic film which forms, at the same time, elastic elements within the stretchable regions 29, 30. Figure 4 illustrates a simplified embodiment in which one edge-part 35 of an elastically stretchable film 36 has been folded in over itself, so as to obtain triple film thickness within the aforesaid edge-part 35. In the case of the embodiment illustrated in Figures 1-3, this edge-part 35 may be included in the elastically stretchable waist part 31, 32 at the waist opening 9 of the diaper pants, while remaining parts of the film 36 are included in the elastically stretchable region in the front-part 1 and/or the back-part 2.

**[0034]** The pants-type diapers also include other elastically stretchable elements 34, preferably in the form of elastically stretchable bands, ribbons, threads or

the like which are mounted in a pre-stretched state along the respective side-edges 8 of the crotch-part of the diaper, from a border region between the front-part 1 and the crotch-part 3 to a border region between the back-part 2 and the crotch-part 3. In the Figure 1 embodiment, the aforesaid other elastic elements 34 are two in number along respective side-edges 8, although this number may equally as well be greater and fewer than two. The aforesaid further elastic elements 34 exhibit in a direction towards the front-part 1 a successively decreasing distance between two elements 34 mounted on respective sides of the absorbent pad 14.

**[0035]** It will be understood, however, that the aforesaid further elastic elements 34 may be disposed in any other pattern whatsoever, for instance they may be disposed generally parallel with the longitudinal direction of the absorbent pad.

**[0036]** The invention shall not be considered restricted to the illustrated exemplifying embodiments thereof, since several variations are conceivable within the scope of the following Claims.

#### Claims

1. An absorbent pants-type diaper which is intended for one-time use only and which comprises front-part (1), a back-part (2), a crotch-part (3) between the front and back parts (1,2), at least two side-closure parts (12, 13) which mutually join parts of the side-edges (4, 5) of respective front and back parts, so that the pants-type diaper will present a waist opening (9) and two leg openings (10, 11), wherein the pants-type diaper further comprises an elongated absorbent pad comprising at least one absorbent layer (14) having a front and a rear end-part (17, 18) and an intermediate centre-part (19), an inner casing layer (15) placed on that side of the absorbent layer (14) which is intended to face towards the wearer, and an outer casing layer (16) which is placed on the other side of the absorbent layer (14), characterized in that essentially the whole of the respective front and/or back part (1, 2) is covered by an elastically stretchable region (29, 30); in that the crotch-part (3) is essentially non-stretchable in relation to said stretchable region (29, 30); in that at least one of respective end-parts (17, 18) of the absorbent layer (14) is disposed within one of said elastically stretchable regions (29, 30), while the centre-part (19) of the absorbent layer is disposed within the relatively non-stretchable crotch-part (3) of the diaper, and that at least one of the stretchable regions (29, 30) is disposed on the side of the absorbent layer (14) facing away from the inner casing layer (15), whereby those forces that are exerted by the elastically stretchable region (29, 30) on the end-part or end-parts (17, 18) of the absorbent layer function to hold the

absorbent layer (14) in sealing abutment with the wearer when the pants-type diaper is worn.

2. A pants-type diaper according to claim 1, **characterized** in that the stretchable region (29, 30) extends beyond the side-edges (20, 21) and the end-edge (22, 23) of the front and/or back end-parts of the absorbent layer.
3. A pants-type diaper according to claim 1 or claim 2 **characterized** in that essentially the whole of both of the front and back parts (1, 2) are covered by the stretchable region (29, 30).
4. A pants-type diaper according to any one of the preceding claims **characterized** in that the stretchable region (29, 30) is stretchable essentially in the transverse direction of the absorbent pad but is essentially non-stretchable in the longitudinal direction of said pad.
5. A pants-type diaper according to any one of the preceding claims **characterized** in that the stretchable region (29, 30) includes elastically stretchable elements (26), for instance elastically stretchable threads, bands, ribbons or the like, which are mounted in a pre-stretched state.
6. A pants-type diaper according to any one of claims 1-4 **characterized** in that the stretchable region (29, 30) includes an elastically stretchable material layer (36), for instance an elastically stretchable film, an elastically stretchable non-woven material, laminate, foamed material or the like.
7. A pants-type diaper according to claim 5 or claim 6, **characterized** in that the elastically stretchable elements (26) or the material layer (36) are/is joined with at least one of the casing layers (15, 16), at least in separate regions.
8. A pants-type diaper according to any one of claims 1 to 7, **characterized** in that the stretchable elements (26) or the material layers (36) of the stretchable regions (29, 30) are applied to the outside of the outer casing layer (16) and are covered by at least one additional outer casing layer (27, 28) of textile-like material.
9. A pants-type diaper according to any one of the preceding claims **characterized** in that the end-edge (6, 7) of the front and/or the back parts has at the waist opening (9) of the pants elastically stretchable waist parts (31, 32) whose stretching and contraction power is greater than the remainder of the stretchable region (29, 30) in the front and/or the back parts (1, 2).

10. A pants-type diaper according to claim 9, **characterized** in that the elastically stretchable waist part (31, 32) at the waist opening (9) includes elastically stretchable elements (33), for instance elastic threads, bands, ribbons or the like, which are mounted in a pre-stretched state.
11. A pants-type diaper according to claims 6 and 9, **characterized** in that the elastically stretchable waist part (31, 32) at the waist opening (9) includes an edge-part (35) of the elastically stretchable material layer (36), said edge-part (35) having a thickness which is at least twice the thickness of the remaining parts of said elastically stretchable material layer (36), by virtue of being folded in over itself at least once within said edge part (35).
12. A pants-type diaper according to any one of the preceding claims, **characterized** in that further elastically stretchable elements (34), preferably in the form of elastically stretchable bands, ribbons threads or the like mounted in a pre-stretched state, are disposed along the side-edges (8) of the diaper, at least within the crotch-part (3) and preferably so that the distance between two further elastically stretchable elements (34) mounted on respective side edges (8) will decrease successively in a direction towards said front-part.
13. Diaper pants according to any one of the preceding claims, **characterized** in that the outer casing layer (16) is liquid impermeable; in that the outer casing layer in the front and the back part extends only slightly beyond the edges of the absorbent pad (14); and in that the parts of the front and the back parts (1 and 2 respectively) which lie outside the outer casing layer are comprised of liquid-permeable and/or air-permeable material.

#### 40 Patentansprüche

1. Absorbierende Höschenwindel, die nur für Einmalgebrauch bestimmt ist, mit einem Vorderteil (1), einem Rückteil (2), einem Schrittteil (3) zwischen dem Vorderteil und dem Rückteil (1, 2), mindestens zwei Seitenverschlußteilen (12, 13), die beiderseitig Teile der Seitenränder (4, 5) jeweils der Vorder- und Rückteile verbinden, so daß die Höschenwindel eine Taillenöffnung (9) und zwei Beinöffnungen (10, 11) umfaßt, wobei die Höschenwindel weiterhin ein verlängertes, absorbierendes Polster enthält, das zumindest eine absorbierende Schicht (14) mit einem vorderen und einem hinteren Endteil (17, 18) und einem dazwischenliegenden Zentralteil (19), eine innere, an der Seite der absorbierenden Schicht (14) angeordnete innere Ummantelungsschicht (15), die dem Tragenden zugewandt sein soll und eine äußere Ummantelungsschicht (16)

- beinhaltet, die an der anderen Seite der absorbierenden Schicht (14) angeordnet ist, dadurch gekennzeichnet, daß im wesentlichen die Gesamtheit des jeweiligen Vorder- und/oder Rückteils (1, 2) von einem elastisch dehnbaren Bereich (29, 30) bedeckt ist; daß das Schritteil (3) mit Bezug auf den dehnbaren Bereich (29, 30) im wesentlichen nicht dehnbar ist; daß mindestens eines der jeweiligen Endteile (17, 16) der absorbierenden Schicht (14) in einem der elastisch dehnbaren Bereiche (29, 30) angeordnet ist, wobei das Zentralteil (19) der absorbierenden Schicht in dem relativ nicht-dehnbaren Schritteil (3) der Windel angeordnet ist; und daß mindestens einer der dehnbaren Bereiche (29, 30) an der Seite der absorbierenden Schicht (14) angeordnet ist, die von der inneren Ummantlungsschicht (15) abgewandt ist, wodurch die Kräfte, die durch den elastisch dehnbaren Bereich (29, 30) auf das Endteil oder die Endteile (17, 18) der absorbierenden Schicht ausgeübt werden, fungieren, um die absorbierbare Schicht (14) in dichtendem Anliegen mit dem Tragenden zu halten, wenn die Höschenwindel getragen wird.
2. Höschenwindel nach Anspruch 1, dadurch gekennzeichnet, daß der dehnbare Bereich (29, 30) sich über die Seitenränder (20, 21) und den Endrand (22, 23) der vorderen und/oder hinteren Endteile der absorbierbaren Schicht erstreckt.
  3. Höschenwindel nach Anspruch 1 oder Anspruch 2, dadurch gekennzeichnet, daß im wesentlichen die Gesamtheit sowohl des Vorder- als auch des Rückteils (1, 2) von dem dehnbaren Bereich (29, 30) bedeckt wird.
  4. Höschenwindel nach mindestens einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß der dehnbare Bereich (29, 30) im wesentlichen in Querrichtung zu dem absorbierenden Polster dehnbar ist, jedoch in Längsrichtung zu dem Polster im wesentlichen nicht dehnbar ist.
  5. Höschenwindel nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß der dehnbare Bereich (29, 30) elastisch dehnbare Elemente (26) einschließt, zum Beispiel elastisch dehnbare Fäden, Bänder, Gummis oder ähnliches, die in einem vorgedehnten Zustand befestigt sind.
  6. Höschenwindel nach mindestens einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß der dehnbare Bereich (29, 30) eine elastisch dehnbare Stoffschicht (36) einschließt, zum Beispiel einen elastisch dehnbaren Film, einen elastisch dehnbaren Nonwoven-Werkstoff, Laminat, geschäumten Werkstoff oder ähnliches.
  7. Höschenwindel nach Anspruch 5 oder Anspruch 6, dadurch gekennzeichnet, daß die elastisch dehnbaren Elemente (26) oder die Stoffschicht (36) mit zumindest einer der Ummantlungsschichten (15, 16) zumindest in separaten Bereichen verbunden ist/sind.
  8. Höschenwindel nach mindestens einem der Ansprüche 1 bis 7, dadurch gekennzeichnet, daß die dehnbaren Elemente (26) oder die Stoffschichten (36) der dehnbaren Bereiche (29, 30) auf die Außenseite der äußeren Ummantlungsschicht (16) aufgebracht und durch zumindest eine weitere äußere Ummantlungsschicht (27, 28) aus textilähnlichem Werkstoff bedeckt sind.
  9. Höschenwindel nach mindestens einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Endkante (6, 7) der Vorder- und/oder der Rückteile an der Taillenöffnung (9) der Höschen elastisch dehnbare Taillenteile (31, 32) aufweist, deren Dehnungs- und Kontraktionskraft größer ist als der Rest des dehnbaren Bereichs (29, 30) in den Vorder- und/oder Rückteilen (1, 2).
  10. Höschenwindel nach Anspruch 9, dadurch gekennzeichnet, daß das elastisch dehnbare Taillenteil (31, 32) an der Taillenöffnung (9) elastisch dehnbare Elemente (33) einschließt, zum Beispiel elastische Fäden, Bänder, Gummis oder ähnliches, die in einem vorgedehnten Zustand befestigt sind.
  11. Höschenwindel nach den Ansprüchen 6 und 9, dadurch gekennzeichnet, daß das elastisch dehnbare Taillenteil (31, 32) an der Taillenöffnung (9) ein Randteil (35) aus der elastisch dehnbaren Stoffschicht (36) einschließt, wobei das Randteil (35) eine Dicke aufweist, die mindestens die doppelte Dicke der restlichen Teile der elastisch dehnbaren Stoffschicht (36) ist, aufgrund dessen, daß es mindestens einmal innerhalb des Randteils (35) über sich selbst eingefaltet wird.
  12. Höschenwindel nach mindestens einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß weitere dehnbare Elemente (34), vorzugsweise in Form von in einem vorgedehnten Zustand befestigten, elastisch dehnbaren Bändern, Gummis, Fäden oder ähnlichem, entlang der Seitenränder (8) der Windel angeordnet sind, zumindest innerhalb des Schritteils (3) und vorzugsweise so, daß sich die Entfernung zwischen zwei weiteren, an den jeweiligen Seitenränder (8) befestigten, elastisch dehnbaren Elementen (34) in Richtung des Vorderteils zunehmend verringern wird.
  13. Höschenwindel nach mindestens einem der vorhergehenden Ansprüche, dadurch gekennzeichnet,



daß die äußere Ummantelungsschicht (16) flüssigkeitsundurchlässig ist; daß die äußere Ummantelungsschicht in dem Vorder- und Rückteil sich nur geringfügig über die Ränder des absorbierenden Polsters (14) erstreckt; und daß die Teile der Vorder- und Rückteile (entsprechend 1 und 2), die außerhalb der äußeren Ummantelungsschicht liegen, aus flüssigkeitsdurchlässigem und/oder luftdurchlässigem Werkstoff bestehen.

#### Revendications

1. Couche-culotte absorbante de type sous-vêtement, qui est destinée à un usage unique et qui comprend une partie avant (1), une partie arrière (2), une partie d'entre-jambes (3) située entre les parties avant et arrière (1, 2), au moins deux parties de fermeture latérale (12, 13) qui réunissent l'une à l'autre des parties des bords latéraux (5, 6) des parties avant et arrière respectives, de sorte que la couche-culotte présente une ouverture pour la taille (9) et deux ouvertures pour les jambes (10, 11), ladite couche-culotte comprenant en outre un coussin absorbant allongé contenant au moins une couche absorbante (14) avec des parties d'extrémité avant et arrière (17, 18) et une partie centrale intermédiaire (19), une couche d'enveloppe intérieure (15) placé sur le côté de la couche absorbante (14) destiné à se trouver en face de l'utilisateur et une couche d'enveloppe extérieure (16) placée de l'autre côté de la couche absorbante (14), caractérisée en ce que pratiquement la totalité de la partie avant et/ou arrière respective (1, 2) est recouverte d'une région élastiquement extensible (29, 30), en ce que la partie d'entre-jambes (3) est essentiellement non extensible par rapport à ladite région extensible (29, 30), en ce que l'une au moins des parties d'extrémité respectives (17, 18) de la couche absorbante (14) est placée dans l'une desdites régions élastiquement extensibles (29, 30) alors que la partie centrale (19) de la couche absorbante est placée dans la partie d'entre-jambes (3) relativement non extensible de la couche-culotte, et en ce que l'une au moins des régions extensibles (29, 30) est placée sur le côté de la couche absorbante (14) situé loin de la couche d'enveloppe intérieure (15), de sorte que les forces qui sont exercées par la région élastiquement extensible (29, 30) sur la ou les partie(s) d'extrémité (17, 18) de la couche absorbante ont pour effet de maintenir la couche absorbante (14) en contact étanche avec l'utilisateur quand la couche-culotte est portée.
2. Couche-culotte selon la revendication 1, caractérisée en ce que la région extensible (29, 30) s'étend au-delà des bords latéraux (20, 21) et des bords d'extrémité (22, 23) des parties d'extrémité avant et/ou arrière de la couche absorbante.
3. Couche-culotte selon la revendication 1 ou 2, caractérisée en ce que pratiquement la totalité des parties avant et arrière (1, 2) est recouverte par la région extensible (29, 30).
4. Couche-culotte selon l'une quelconque des précédentes revendications, caractérisée en ce que la région extensible (29, 30) est extensible essentiellement dans la direction transversale du coussin absorbant mais est essentiellement non extensible dans la direction longitudinale dudit coussin.
5. Couche-culotte selon l'une quelconque des précédentes revendications, caractérisée en ce que la région extensible (29, 30) contient des éléments élastiquement extensibles (26), par exemple des fils, des bandes, des rubans ou autres éléments élastiquement extensibles qui sont montés dans un état de pré-extension.
6. Couche-culotte selon l'une quelconque des revendications 1 à 4, caractérisée en ce que la région extensible (29, 30) contient une couche de matériau élastiquement extensible (36), par exemple un film élastiquement extensible, un matériau non-tissé élastiquement extensible, un matériau stratifié, un matériau en mousse ou analogue.
7. Couche-culotte selon l'une quelconque des revendications 5 ou 6, caractérisée en ce que les éléments élastiquement extensibles (26), ou la couche de matériau (36), sont/est réuni(s) à l'une au moins des couches d'enveloppe (15, 16) au moins dans des régions séparées.
8. Couche-culotte selon l'une quelconque des revendications 1 à 7, caractérisée en ce que les éléments élastiquement extensibles (26), ou la couche de matériau (36), des régions extensibles (29, 30) sont appliqués à l'extérieur de la couche d'enveloppe extérieure (16) et sont recouverts par au moins une couche supplémentaire d'enveloppe extérieure (27, 28) en matériau semblable à du textile.
9. Couche-culotte selon l'une quelconque des précédentes revendications, caractérisée en ce que le bord d'extrémité (6, 7) des parties avant et/ou arrière comporte, au niveau de l'ouverture de taille (9) de la culotte, des parties de ceinture (31, 32) élastiquement extensibles, dont la puissance d'extension et de contraction est supérieure à celle du reste de la région extensible (29, 30) dans les parties avant et/ou arrière (1, 2).
10. Couche-culotte selon la revendication 9, caractérisée en ce que la partie de ceinture élastiquement extensible (31, 32) se trouvant au niveau de l'ouverture de taille (9) contient des éléments élastique-

ment extensibles (33), par exemple des fils, des bandes, des rubans ou autres éléments élastiquement extensibles qui sont montés dans un état de pré-extension.

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11. Couche-culotte selon les revendications 6 et 9, caractérisée en ce que la partie de ceinture élastiquement extensible (31, 32) se trouvant au niveau de l'ouverture de taille (9) comprend une partie de bord (35) de la couche (36) de matériau élastiquement extensible, ladite partie de bord (35) ayant une épaisseur qui est au moins le double de l'épaisseur des parties restantes de ladite couche (36) de matériau élastiquement extensible du fait qu'elle est repliée sur elle-même au moins une fois dans ladite partie de bord (35). 10 15
12. Couche-culotte selon l'une quelconque des précédentes revendications, caractérisée en ce que d'autres éléments élastiquement extensibles (34), se présentant de préférence sous la forme de bandes, rubans, fils ou autres éléments élastiquement extensibles montés dans un état de pré-extension, sont disposés le long des bords latéraux (8) de la couche-culotte, au moins dans la partie d'entre- 20 25 jambes (3) et de préférence de telle sorte que la distance entre deux de ces autres éléments élastiquement extensibles (34) montés sur les bords latéraux respectifs (8) diminue progressivement dans la direction de ladite partie avant. 30
13. Couche-culotte selon l'une quelconque des précédentes revendications, caractérisée en ce que la couche d'enveloppe extérieure (16) est imperméable aux liquides, en ce que la couche d'enveloppe 35 extérieure ne s'étend dans les parties avant et arrière que légèrement au-delà des bords du coussin absorbant (14), et en ce que les régions des parties avant et arrière (1 et 2 respectivement) qui sont situées à l'extérieur de la couche d'enveloppe 40 extérieure sont faites d'un matériau perméable aux liquides et/ou perméable à l'air. 45 50 55

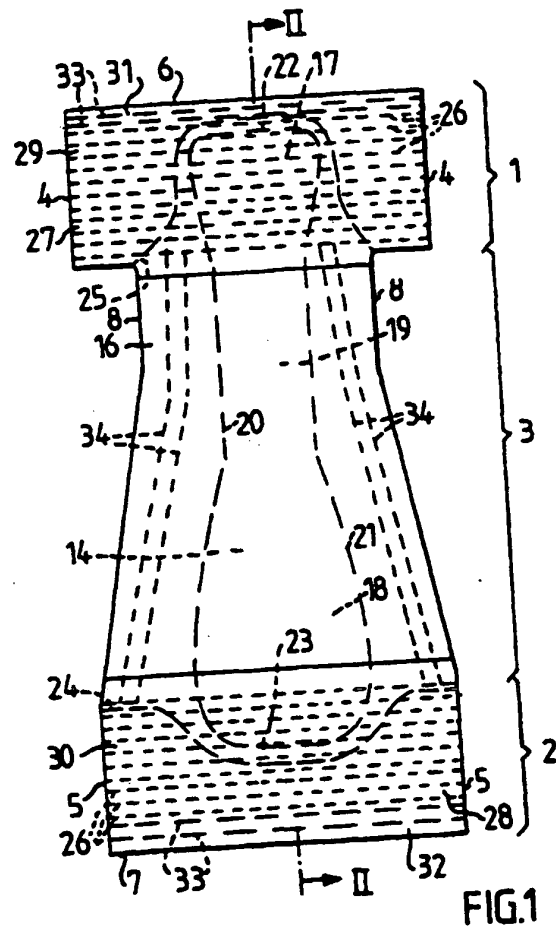


FIG. 1

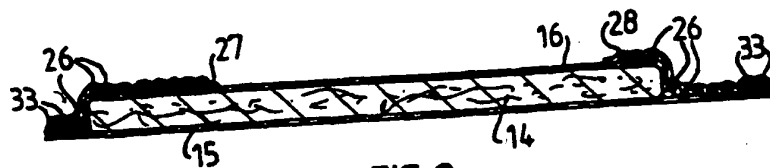


FIG. 2

